

Aeration enhances vegetation growth and microbial degradation of spilled substances by increasing oxygen levels in subsurface soils. Aerate soils manually by repeatedly driving a pitchfork through the tundra root mat and into organic soils. Aerate soils mechanically by pushing or pulling a rotating barrel fitted with tines over the tundra. Tines should be long enough to penetrate the root mat and reach the organic soil horizon. Tilling (Tactic T-19) and draining (Tactic T-14) will also aerate soils.

APPLICABILITY

| | APPLICABILITY | COMMENTS |
|----------------------|-------------------------|---|
| SPILLED SUBSTANCE | All | Low viscosity substances may migrate downward with aeration. |
| TUNDRA TYPE | All | Most applicable on dry tundra sites. Moist and wet tundra will be difficult to aerate without prior draining (Tactic T-14). |
| SEASON | Spring, summer, fall | Most beneficial during growing season. Difficult to penetrate root mat and soils when ground is frozen. Low viscosity substances are more likely to infiltrate subsurface soils if spill occurs during thawed conditions. |

CONSIDERATIONS AND LIMITATIONS

- Method of aeration will be determined by the size of a site and its topography.
- Mechanical aeration (with a rotating barrel) may not be practicable in tussock tundra.
- Use of vehicles on tundra must comply with applicable tundra travel policies (Tactic P-5).
- Aerate the active layer to the depth of contaminant penetration to stimulate microbial degradation of contaminant
- This tactic has been used with success to increase oxygen supply to crude-oil-affected soils in
 moist or wet North Slope tundra (Cater and Jorgenson, 1994). Information on the effectiveness of this tactic is based on field observations, not controlled experiments. No test data exist
 which document whether the use of this tactic results in long-term benefits to tundra restoration compared with other tactics, combinations of tactics, or "no action."

EQUIPMENT, MATERIALS, AND PERSONNEL

- Pitchfork (1 operator) to punch holes through tundra surface
- Rotating barrel with tines (1 operator) to punch holes through tundra surface
- Vehicle approved for summer tundra travel (1 operator) to pull rotating barrel over tundra surface